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IN THE APPLICATION

OF

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FOR AN

INSULATED HOT WATER STORAGE TANK FOR SINK

INSULATED HOT WATER STORAGE TANK FOR SINK

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates generally to plumbing systems.
5 More specifically, the invention is an insulated hot water storage tank connected to the hot water supply line adjacent a hot water faucet.

2. DESCRIPTION OF THE RELATED ART

The related art of interest describes hot water tanks, but
10 does not disclose any hot water storage tank located under a sink. There is a need for a remote, but adjacent hot water tank to supply hot water immediately to the sink faucet. The relevant art will be discussed in the order of perceived relevance to the present invention.

15 U.S. Patent No. 4,160,461 issued on July 10, 1979, to Marcel Vataru et al. describes a water and energy conservation system comprising a hot water storage tank connected between a hot water line and a hot water faucet. When the hot water faucet is turned on, the water in the hot water line is conducted into the reservoir where it accumulates until the water in the reservoir reaches a predetermined temperature. At this time, the reservoir

is drained through the hot water faucet. The system requires a hot water tank including a spring, piston and a reservoir with a thermostatic valve connected to an on/off switch. The system is distinguishable for requiring a hot water tank having a piston driven by a spring.

U.S. Patent No. 5,339,859 issued on August 23, 1994, to Gerald E. Bowman describes a water conservation system comprising a thermostatically controlled valve means effectively diverting water from a hot water tank to a storage tank until the temperature or the water reaches a predetermined temperature. The stored water is mixed with the water directed to the cold water conduit initially by pressure in the storage tank and by siphon action. The system is distinguishable for requiring a thermostatically controlled valve means.

U.S. Patent No 4,628,902 issued on December 16, 1986, to Cornelius J. Comber describes a hot water distribution system comprising a closed loop hot water line, wherein water sitting in the hot water line between use is circulated back into the hot water heater when its temperature drops below a specified level by a thermally operated switch and a one-way check valve. The hot water line is insulated to prevent water in it from cooling excessively. The system is distinguishable for requiring a thermally operated switch and a check valve.

U.S. Patent Application Publication No. US 2003/0185548 A1 published on October 2, 2003, for Don Novotny et al. describes an instant in-line water heater using electrically conductive polymer structures for electrodes. The device is distinguishable
5 for being limited to an in-line water heater.

U.S. Patent No. 3,705,574 issued on December 12, 1972, to Angelo N. Duncan describes a water heating and storage system with a thermostatic mixing valve comprising a single water heater, a storage tank and pump combination to provide hot water
10 for various uses. By this system, heated water is mixed with cold water supplied to the water heater to be heated. The system is distinguishable for requiring a thermostatic mixing valve.

U.S. Patent No. 3,799,181 issued on March 26, 1974, to Herbert J. Maddren describes a hot water supply system wherein if
15 the hot water temperature is below the required temperature, the water is recirculated to a hot water heater. The flow path of the water is either through the hot water faucet or directed back to the hot water heater dependent on the water temperature. The system is distinguishable for requiring the recirculation of
20 below hot water temperature water destined for the hot water faucet.

U.S. Patent No. 4,450,829 issued on May 29, 1984, to Deen I. Morita et al. describes a water saving system for a dwelling comprising provision for avoiding the water waste due to letting

the water run until hot water reaches an open hot water faucet of valve. Adjacent each hot water outlet valve a control unit is installed having an inlet connected to a hot water supply line from the water heater, a supply outlet connected to the hot water faucet or valve and a return outlet connected by a return line to an inlet of the water heater. Between the inlet and the supply outlet of the control unit there is a normally closed valve which is thermostatically controlled so as to open only when water in the control unit is at or above a predetermined temperature. When a hot water faucet or valve is opened and water in the hot water supply line has cooled to a temperature below a predetermined value, the control valve remains closed and water in the hot water supply line is returned to the water heater by a circulating pump. When hot water reaches the control unit, the control valve is thermostatically opened so as to supply a full flow of hot water to the faucet or outlet valve. The water circulating pump is then turned off, thereby avoiding a waste of energy that would be due to continuous operation of the pump. The system is distinguishable for requiring a pump and thermostatic controls.

U.S. Patent No. 4,606,325 issued on August 19, 1986, to Albert G. Lujan, Jr. describes a multi-controlled water conservation system for hot water lines with a low pressure utilization disablement comprising a recirculating cooled hot water supply line from the cooled-off end of a hot water line back to the hot water heater of the hot water distribution

system. The system is provided with a plurality of control means to electrically energize the system's recirculating pump as long as a pressure switch detects that the main water supply is providing sufficient water pressure to the system. In operation
5 the recirculating pump opens a check valve in the recirculating line and closes the check valve in the main water supply line, and recirculates the cooled hot water back to the hot water heater for ultimate use. If the main water supply has insufficient pressure, the recirculating cooled hot water system
10 is non-functional. The system is distinguishable for requiring a recirculating pump and check valves.

U.S. Patent No. 4,697,614 issued on October 6, 1987, to Debora L. Powers et al. describes a water conservation system for a sink comprising the provision of valved outlets for the
15 discharge ends of hot and cold water pipes. A by-pass pipe communicates the hot and cold water pipes upstream and closely adjacent the hot and cold water outlets. A water accumulator communicates with a mid-length portion of the by-pass pipe, a remotely operable flow-control valve is serially connected in the
20 by-pass pipe intermediate the accumulator and the hot water pipe and an adjustable pressure regulator is serially connected in the cold water pipe closely upstream from the by-pass pipe. The system is distinguishable for requiring a water accumulator, a remotely operable flow-control valve, and an adjustable pressure regulator device.

U.S. Patent No. 5,351,712 issued on October 4, 1994, to John A. Houlihan describes a hot water recovery system comprising a dual chamber, dual hot water outlet, water heating reservoir, and a flow control and recovery apparatus in fluid communication with a cold water supply and hot water outlets. The flow control is preprogrammed to, upon command, to drain standing water from the hot water outlets, and refill the outlets with hot water from the small chamber of the water-heating reservoir, making hot water available at the instant an outlet is opened. During hot water use, the system delivers hot water to the hot water outlets from the large chamber of the water-heating reservoir. Discontinuance of hot water use, for a time, causes the flow control to configure the recovery apparatus to return hot water in the hot water outlets, before it cools, to the small chamber. The recovery apparatus refills the empty hot water outlets with cold water, then resets to the ready condition. The system is distinguishable for requiring a preprogrammed flow control and recovery apparatus, and a dual chamber, dual hot water outlet, water heating reservoir.

U.S. Patent No. 5,775,372 issued on July 7, 1998, to John A. Houlihan describes a universal water and energy conservation system comprising the pre-selected opening and closing of remotely actuated valves altering conduit paths to avoid water waste down the drain, and waiting for hot water. Hot water delivered from the hot water supply is completely used, eliminating the energy waste of hot water cooling in the pipes.

On command from a radio control unit or a remote control unit, a power control unit energizes flow controller pre-programmed to selectively energize and de-energize a remotely activated valve and the pump of the flow control unit to simultaneously deliver hot water and re-circulate standing water in applicable conduits to the hot water supply. Automatically, or by the user's override command near the end of the selected use cycle, another conduit path is provided. Cold water supply pressure to hot water supply is interrupted through a normally open and remotely actuated valve, and is re-directed through a normally closed, remotely actuated valve forcing delivered hot water to the open outlet until used. The system is distinguishable for requiring the use of programming to energize remotely activated valves and the pump.

U.S. Patent No. 6,030,067 issued on March 21, 2000, to John A. Houlihan describes a selectable control energy and water conservation system comprising the control of water pressure to a hot water supply by a selectable flow control valve. A hot water manifold and check valves produce a dual line connection between a hot water manifold and the hot water use area. In the water saver mode, positioning selectable flow control valve causes a pump to draw water from the distribution conduit through the selectable flow control valve, through the cold water manifold and solenoid valve to the hot water supply. A pump causes hot water to fill the distribution conduit to the hot water use area. This circulation delivers hot water to replace water standing in

the line. The circulation period is determined by a controller. When the selectable flow control valve is positioned to the use mode, supply pressure at the cold water conduit is applied through the selectable flow control valve, then via the cold water manifold to the hot water supply. Positioning the selectable flow control valve to the energy saver mode causes the cold water pressure to be interrupted to the hot water supply and directed through a feedback conduit to a junction downstream from the hot water manifold. Supply pressure forces hot water towards the open hot water outlet, thus resulting in utilization of all the hot water delivered from the hot water manifold. The system is distinguishable for requiring hot and cold water manifolds, check valves, and selectable flow control valves.

France Patent Publication No. 2 750 480 A1 published on January 2, 1998, for Michel Paquot describes a comprehensive domestic heating, refrigeration, and water system comprising a well and a reversible heat pump delivering hot water at 45-50 degrees C. applied to domestic heating and water heating. Chilled water at 3-6 degrees C. is obtained, which is applied to air conditioning, cold storage and wine cellar use. The space heating system includes room heater/air conditioners, circulating fans, and wall heating coils. The system is distinguishable for requiring domestic heating, refrigeration and a water system.

U.K. Patent Application No. 2 352 805 A published on February 7, 2001, for Houghton A. Gledhill et al. describes a hot

water system comprising a thermal storage tank and a primary water circuit heated by either a gas or oil fired boiler. An additional electric water heating means is supplied for switching on selectively to heat the primary water in the hot water system. The electric water heating means can be located in the pipe work connecting the storage tank and the boiler. The system is distinguishable for requiring an additional electric water heating means for switching purposes.

Russia Patent Application No. RU 2 176 363 C1 published on November 27, 2001, for Ju V. Fundator et al. describes a heating temperature limiter of a hot water heating system and a single-pipe scheme comprising a heating temperature limiter has delivery and drain tee pieces whose taps re joined by a curvilinear by-pass and thermostatic valve separately installed on direct passage of the delivery tee piece. The heating temperature limiter has similar flow sections of direct passages of tee pieces, by-pass, and nozzle mounted for varying the amount of heat conveyed into the apparatus and a reduced pressure value at the joint between the tap and direct passage of the drain tee piece. Nozzle setting depends on the location of the heating assembly in a single-pipe scheme of the building. The proposed method provides for saving heat energy delivered directly to a house, reducing the pressure drop in the system, and reducing power requirement of a heating system pump. The system is distinguishable for requiring the reduction of the water pressure drop in a house system.

Romania Patent Application No. RO 117399 B published on February 28, 2002, for Totoescu O. Dan Nicolae describes an instant water heater provided with a distributor for housekeeping. The heater comprises a nipple for the connection to the water source mounted inside a body and sealed by a gasket from the body. The nipple also operates as a valve seat allowing or not the water to flow into a distributor comprising another body and a slide valve so that the valve seat and the slide valve, mutually integral and coaxial, be driven in a forward motion by means of a nut-screw system, made up of a rod and a special nut coupled with the slide valve, providing the water distribution directly to the outlet. On the lid some mounted electrodes supplied with voltage control the mixture of cold and hot water in the chamber. The system is distinguishable for requiring a heater having a nipple operating as a valve seat and a slide valve.

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed. Thus, an economical hot water storage tank for a sink with a minimum of apparatus solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

The invention is an insulated hot water storage tank under a sink comprising a tank having an inlet for hot water from the

residential hot water tank, and an outlet connected by pipe to the sink's hot water outlet for the sink's faucet. As soon as the faucet is opened for hot water, hot water from the storage tank under the sink will be supplied instead of the usual cold or warm water to the faucet. Thus, immediate hot water service is obtained at sink's faucet instead of the usual wasting of water that has cooled during non-use.

Accordingly, it is a principal object of the invention to provide a sink with an adjacent hot water tank.

It is another object of the invention to provide a hot water tank that will supply initially hot water effluent to the sink's faucet.

It is a further object of the invention to provide a hot water tank having insulation.

Still another object of the invention is to provide hot water influent by a conduit from the residential hot water tank.

It is an object of the invention to provide improved elements and arrangements thereof for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an environmental, perspective view of a hot water storage tank under a sink according to the present invention.

FIG. 2 is a schematic side view of the FIG. 1 hot water storage system without the external insulated tank.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is illustrated in FIG. 1 as a hot water tank system 10 under a water faucet 12 of a kitchen sink 14 having a hot water valve 16, a cold water valve 18, and a cold water supply pipe 20. Inside the kitchen cabinet 22 with twin doors 24 open is the system 10 that could be applied also to a toilet sink, a bathtub, and the like. The system 10 comprises a metal or plastic hot water storage tank 26 of any shape, e.g., rectangular tank, having a hot water supply pipe 28 feeding hot water from the household water heater tank (not shown) to the influent nipple element 30. The tank 26 has a removable base portion 32 via clamps 34 for gaining access to the tank for cleaning purposes. The effluent nipple element 36 on the tank 26 is connected to an effluent pipe 38 supplying hot water to the water faucet 12.

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FIG. 2 shows a schematic cross-sectional view of the hot water storage tank 26 showing the hot water 40 flowing from the hot water influent nipple element 30 to the hot water effluent

nipple element 36. The tank 26 has either surrounding insulation such as fiberglass or foam rubber (not shown) or can be vacuum insulated to maintain the temperature of the hot water contained.

5 The capacity of the hot water tank can be from approximately a quart to a gallon. The washtub can be a bathtub with the system displaced within a cavity.

10 It should be noted that there are no moving parts in this apparatus. An ergonomic benefit in utilizing this system is the benefit of not wasting cold water when turning on the hot water faucet. When considered as a heating cost saving over a length of time such as yearly, one can readily appreciate the saving.

It is to be understood that the present invention is not limited to the embodiment described above, but encompasses any and all embodiments within the scope of the following claims.